

REMARKS

Applicants wish to thank the Examiner for the thorough review and consideration of the subject application. The Non-Final Office Action of March 26, 2003, has been received and its contents carefully noted. By this amendment, claims 1-7 and 9-40 have been amended and claims 8 and 41-44 have been cancelled without prejudice or disclaimer. Accordingly, claims 1-7 and 9-40 are currently pending in the application, of which claims 1, 6 and 11 are independent claims.

In view of the above amendments and the following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending objections and rejections for the reasons discussed below.

Claim Objection

In the Office Action, claim 38 was objected to because a space should be inserted to separate "said" and "carbon" in line 1.

Claim 38 has been amended to include a space between "said" and "carbon" in line 1. This amendment is made for the sole purpose of correcting claim 38. This amendment is not made for the purpose of avoiding prior art or narrowing the claimed invention, and no change in claim scope is intended. Therefore Applicants do not intend to relinquish any subject matter by these amendments. Applicant respectfully submits that claim 38, as amended, overcomes the stated objection. Accordingly, Applicants respectfully request withdrawal of the objection for claim 38.

Provisional Rejection Under 35 U.S.C. §101

Claims 1-15 and 40-44 stand provisionally rejected under 35 U.S.C. §101 as claiming the same invention as that of claims 1-20, of co-pending Application No. 09/902,828. Applicants

traverse this rejection for the following reasons. Claims 1-17 and 20 of co-pending Application No. 09/902,828 were cancelled by amendment dated March 4, 2003. Claims 18 and 19 of co-pending Application No. 09/902,828 were also amended at that time. Accordingly, Applicants submit that the provisional rejection under 35 U.S.C. §101 is moot in view of the March 4, 2003 amendment to Application No. 09/902,828.

Provisional Obviousness Type Double Patenting

Claims 1-2 and 4-5 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 5, 7, 9 and 11-12 of co-pending Application No. 09/976,172. Applicants traverse this rejection for the following reasons. Claims 1, 3, 5, 7, 9, and 11-12 of co-pending Application No. 09/976,172 were amended on September 25, 2003 and are broadly directed to activated carbon foam and monolithic activated carbon foam filter element, while claims 1-2 and 4-5 of the present application are broadly directed to certain specific properties of carbon foam. Accordingly, Applicants request that the provisional obviousness type double patenting rejection of claims 1-2 and 4-5 be withdrawn.

Claims 1-6 stand provisionally rejected under the judicially created doctrine of obviousness type double patenting over claims 1-8 of co-pending Application No. 09/941,342. Applicants traverse this rejection for the following reasons. Claims 1-8 of Application No. 09/941,342 were amended on April 29, 2003 and are broadly directed to tooling for composite materials where the body of the tooling is made from carbon foam having certain properties. Claims 1-6 of the present application are directed to carbon foam in general having certain properties. Based on the amendment to Application No. 09/941,342 Applicants submit that this rejection is now moot.

Rejections Under 35 U.S.C. §112, second paragraph

Claim 17 stands rejected under 35 U.S.C. §112, second paragraph as being indefinite. Applicants respectfully traverse this rejection for at least the following reasons. The Examiner asserts that claim 17 does not further limit claim 1 and is therefore indefinite. Claim 17 requires an additional limitation on the high volatile bituminous coal recited in claim 1. Claim 17 specifically requires that the Gieseler initial softening temperature be above about 380° C. This limitation is not recited in claim 1 and further narrows claim 1.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §112, second paragraph rejection of claim 17.

Rejections Under 35 U.S.C. §103

Claims 1-5, 16-27 and 40 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 3,309,437 issued to Harnett ("Harnett") in view of U.S. Patent No. 4,127,391 issued to Koppelman ("Koppelman") combined with Great Brittan Patent No. 1,480,690 issued to Madley et al. ("Madley"), Encyclopedia of Chemical Technology authored by Kirk-Othmer ("Kirk-Othmer"). Applicants respectfully traverse this rejection and request reconsideration for at least the following reasons.

In levying an obviousness rejection under 35 U.S.C. § 103, the Examiner has the burden of establishing (1) some suggestion or motivation to modify the reference or to combine reference teachings, (2) a reasonable expectation of success, and (3) that the prior art references, when combined, teach or suggest all the claim limitations. See MPEP § 2143 (8th Ed., Rev. Feb. 2003). "Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure." See *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Federal Circuit recently emphasized the importance of evidencing the requisite motivation to combine references when rejecting claims based upon obviousness. *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002). In the present case, the Examiner has failed to make the requisite showing, as articulated in *Lee* and its predecessors, of a motivation to combine the Harnett, Madley, Kirk-Othmer and Kuroda. For example, Harnett makes baked or graphitized bodies from raw petroleum coke (column 1, lines 10-11) by heating the raw petroleum coke products to a temperature exceeding 600°C (column 1, lines 56-57) without molding, extruding or mechanical pressure of any kind (column 1, lines 21-22) to form a body with minimum alteration of the pore structure between the particles (column 1, lines 25-30). Koppelman teaches a process for making coke from bituminous fines by heating the bituminous fines at a temperature of at least 750°C and at a pressure of at least about 1000 psi (Koppelman at column 2, lines 29-40). There is no suggestion in the teachings of Harnett or Koppelman that they may be combined. Koppelman specifically teaches away from the teachings of Harnett. Koppelman expressly requires at least 1000 psi while Harnett expressly teaches no molding, extruding or mechanical pressure of any kind. Given the opposite teachings and different starting materials of Harnett and Koppelman, one skilled in the art would not be motivated to combine the teachings of Harnett and Koppelman.

Madley is also cited in the rejection and is combined with Harnett and Koppelman. Madley is directed to making a briquetting coal by heating low-rank, high volatile coal particles in a fluidized bed reactor in the presence of oxygen followed by heating to 600 to 900°C. The coal is then added to caking coal for briquetting by using for example, a double roll press. (Madley at columns 1-2). Madley specifically uses mechanical pressure in forming briquettes, which like Koppelman teaches away from the teachings of Harnett. Given the opposite teachings of Harnett and Madley, one skilled in the art would not be motivated to combine Harnett and Madley.

Lastly, the Examiner has included Kirk-Othmer in the rejection, combined with Harnett, Koppelman, and Madely. Kirk-Othmer describes properties of coal that make a good coke and describes a test where coal is heated in an open crucible. Given that Harnett is expressly directed to heating raw petroleum coke and Kirk-Othmer is directed to coal. There is no motivation or suggestion in these references that they are combinable.

Accordingly, Applicants respectfully submit that there is no suggestion or motivation to modify Harnett or to combine reference teachings of Harnett, Koppelman, Madley, and Kirk-Othmer.

Assuming that the combination of references was proper, there is no reasonable expectation of success. For example, Harnett is directed to using raw petroleum coke heating above 600°C with no pressure while Koppelman teaches making coke using bituminous fines by heating above 750°C under at least 1000 psi. Based on the teachings of these two references there is no reason to believe that one could take the bituminous fines of Koppelman and expose them to no pressure as taught by Harnett and get the bodies taught in Harnett. Koppelman teaches exactly the opposite – 1000 psi is required. Madley also teaches using coal and pressure. Again there is no expectation of success from the teachings of Madley that Madley and Harnett are properly combinable to form the bodies in Harnett. Kirk-Othmer indicates which coals are best at making coke. Harnett is starting from raw petroleum coke. There is no expectation of success based on the teachings of Harnett and Kirk-Othmer. Accordingly, even if the references were properly combinable, there is not reasonable expectation of success.

Lastly, assuming that the references are properly combinable and there is some expectation of success, the references, when combined, fail to teach or suggest all the claim limitations of claim 1.

Claim 1 is allowable over the cited references in that claim 1 recites a combination of elements including, for example, "carbon foam comprising: an open-celled structure produced

by heating high volatile bituminous coal particles in a pressure controlled reactor above about 300°C, under a pressurized non-oxidizing atmosphere having a pressure from about 50 to about 500 psi, wherein said carbon foam has a density ranging from about 0.1 to about 0.8 g/cm³."

None of the cited references either singly or in combination teaches or suggests at least these features. The teachings of each reference is discussed above. None of the references, taken singly or in combination with each other, teach a carbon foam material with an open pore structure. Harnett, Koppelman, Madley, and Kirk-Othmer while making some form of mass, fail to teach or disclose making carbon foam with an open-celled structure as required by claim 1. Additionally, none of the references, taken singly or in combination with each other, teaches the combination of heating bituminous coal particles in a reactor above about 300°C under a non-oxidizing atmosphere having a pressure from about 50 to about 500 psi. Harnett teaches no pressure, Koppelman teaches pressure above 1000 psi, Madley heats coal particles in oxygen (an oxidizing atmosphere) and teaches using a roll press to (an oxidizing atmosphere) form briquettes, and Kirk-Othmer heats coal in a crucible in air under atmospheric pressure.

Accordingly, the Examiner as failed to establish a *prima facie* case of obviousness and Applicants respectfully request the rejection under § 103 be withdrawn.

For at least the foregoing reasons, Applicants respectfully submit that claim 1 and claims 2-7, 16-27 and 40-43, which depend from claim 1 are allowable.

Claims 6-7, 9-10, and 28-39 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Harnett in view of Koppelman combined with Madley, and Kirk-Othmer, in further view of Harnett in view of Koppelman combined with Madley, and Kirk-Othmer. Applicants respectfully traverse this rejection for at least the following reasons.

These references are the same references discussed above. With respect to a motivation to combine these references and reasonable expectation of success, Applicant incorporates the arguments above with respect to this rejection.

Even assuming the references are properly combinable and that there would be a reasonable expectation of success, the references, when combined, fail to teach or suggest all the claim limitations of claim 6.

Claim 6 is allowable over the cited references in that claim 1 recites a combination of elements including, for example, "A method for producing a carbon foam from a high volatile bituminous coal comprising: placing high volatile bituminous coal particles in a pressure controlled mold; and heating said high volatile bituminous coal particles under a pressurized non-oxidizing atmosphere ranging from about 50 to about 500 psi to a temperature ranging from about 300° C to about 700° C." None of the cited references either singly or in combination teaches or suggests at least these features. The teachings of each reference are discussed above. None of the references, taken singly or in combination with each other, teach a method for making a carbon foam material from high volatile bituminous coal. Harnett, Koppelman, Madley, and Kirk-Othmer while making some form of mass, fail to teach or disclose making carbon foam as required by claim 6. Further, none of the references, taken singly or in combination with each other, teaches the combination of heating bituminous coal particles in a pressure controlled reactor to a temperature ranging from about 300°C to about 700°C under a pressurized non-oxidizing atmosphere having a pressure from about 50 to about 500 psi. Harnett teaches no pressure, Koppelman teaches pressure above 1000 psi, Madley heats coal particles in oxygen (an oxidizing atmosphere) and teaches using a roll press to form briquettes, and Kirk-Othmer heats coal in a crucible under atmospheric pressure in air (an oxidizing atmosphere).

Accordingly, for at least the above reasons, the Examiner as failed to establish a *prima facie* case of obviousness and Applicants respectfully request the rejection under § 103 be withdrawn.

For at least the foregoing reasons, Applicants respectfully submit that claim 6 and claims 7, 9-10, and 28-39, which depend from claim 6 are allowable.

Claims 11-15 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Harnett in view of Koppelman combined with Madley, and Kirk-Othmer, in further view of JP Patent No. 8-112876 Patent-Assignee Kuroda ("Kuroda"). Applicants respectfully traverse this rejection for at least the following reasons.

The Examiner alleges that Kuroda teaches laminated sheets comprising a core of charcoal powder (graphitized coal product) and activated carbon powder (carbonized and coal product) and that "it would be obvious to the artisan in the art to use the laminated sheet with a core of [Kuroda] as the laminated sheet with the core of Harnett with the combined teachings of the secondary references.

Harnett and the secondary references are the same references discussed above. With respect to a motivation to combine these references and reasonable expectation of success, Applicant incorporates the arguments above with respect to this rejection.

Even assuming the references are properly combinable and that there would be a reasonable expectation of success, the references, when combined, fail to teach or suggest all the claim limitations of claim 11.

Claim 11 is allowable over the cited references in that claim 1 recites a combination of elements including, for example, "A laminated sheet comprising: a carbon foam core having a surface, wherein said carbon foam is produced from particulate high volatile bituminous coal and has a density of between about 0.1 and about 0.8 g/cm³; and a sheet laminated to said carbon foam surface." None of the cited references either singly or in combination teaches or suggests at least these features.

As discussed above, Harnett, Koppelman, Madley, and Kirk-Othmer, whether taken alone or in combination with one another, fail to teach or suggest a carbon foam produced from

particulate high volatile bituminous coal. Accordingly using the sheet of Kuroda on the core of Harnett and the secondary reference similarly fails to teach or suggest a carbon foam core produced from particulate high volatile bituminous coal.

Based on the abstract of Kuroda, there is nothing to indicate that the charcoal powder and activated carbon powder of Kuroda is a coal product as suggested by the Examiner. Further there is nothing in the abstract of Kuroda that discloses carbon foam as required by Applicant's claim 11. Applicants respectfully request a translation of Kuroda in order to fully interpret the contents of the rejection. Applicants, respectfully submit that Kuroda fails to cure the deficiencies of Harnett, Koppelman, Madley, and Kirk-Othmer as none of the cited references either singly or in combination teaches or suggests, "a carbon foam produced from particulate high volatile bituminous coal" as required by claim 11.

Accordingly, for at least the above reasons, the Examiner as failed to establish a *prima facie* case of obviousness and Applicants respectfully request the rejection under § 103 be withdrawn.

For at least the foregoing reasons, Applicants respectfully submit that claim 11 and claims 12-15, which depend from claim 11 are allowable.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §103(a) rejection of claims 1-7 and 9-40. Since none of the other references of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed invention, Applicants respectfully submit that independent claims 1, 6 and 11, and all the claims that depend therefrom are allowable.

Dependent Claims

Dependent claims 16-25, 28-37 and 40 have additional limitations for the high volatile bituminous coal or the carbon foam. For example, claims 16 and 28 requires that the high volatile bituminous coal contain from about 35% to about 45% by weight volatile matter. Claims 17, 18, 29, and 30 all require a Gieseler initial softening temperature above about 380°C. Claims 19, 20, 31, and 32 require specific plastic temperature ranges. Claims 21, 22, 33, and 34 require maximum fluidity of more than about 300 ddpm. Claims 23, 24, 35, and 36 require certain minimum expansion as determined by Arnu dilation. Claims 25 and 37 require specific properties of the bituminous coal including a carbon percentage from 50 to about 60%, a certain maceral content of less than about 30%, a vitrinite reflectance from about 0.80 to about 0.95 and 0.0 volume % moderate or severe oxidation. Claim 40 requires that the carbon foam have a thermal conductivity below about 1 W/mK.

None of these limitations are present in any of the cited references. The Examiner has taken the position that "the Gieseler initial softening temperature above @ 380°C, a plastic range of at least about 50°C and 75-to about 100°C, the fluidity of at least several hundred ddpm, >2000 ddpm and an expansion of at least 20% and at least 100% are properties that would be inherent when the select coal is as bituminous further rendering the instant claims obvious."

Since none the references teach or suggest these limitation, Applicants presume that the Examiner is making official notice of this assertion. Applicants traverse this assertion and request that the Examiner cite references in support of this assertion. The Examiner may take official notice of facts outside of the record which are capable of instant and unquestionable demonstration as being "well-known" in the art. *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970). As set forth in M.P.E.P. § 2144.03, if an applicant traverses an

assertion made by an Examiner while taking official notice, the Examiner should cite a reference in support of their assertion.

Applicant respectfully submit that claims 16-25, 28-37 and 40 are patentable over the cite references.

CONCLUSION

Applicants believe that a full and complete response has been made to the pending Office Action and respectfully submit that all of the stated objections and grounds for rejection have been overcome or rendered moot. Accordingly, Applicants respectfully submit that all pending claims are allowable and that the application is in condition for allowance.

Should the Examiner feel that there are any issues outstanding after consideration of this response; the Examiner is invited to contact the Applicant's undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,



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